

March 31st.

The President, MR. LEA, in the Chair.

Twenty members present.

On report of the respective Committees, the following papers were ordered to be published in the Proceedings :

ON TRACHYCEPHALUS, SCAPHIOPUS and other American BATRACHIA.

BY E. D. COPE.

TRACHYCEPHALUS, Tsch.

In the most recent enumeration of the species of this genus (by Dr. Günther, 1858,) four are recognized: one,—*T. geographicus*,—from Brazil, and three from the Antilles. I am enabled to add four to the latter, which have been sent from those regions by Messrs. Wright and Weinland, and Professors Poey and Adams, all well known as most efficient laborers in advancing our knowledge of zoology in that field.

It does not appear to have been stated that the males of certain species of this genus,—*T. marmoratus*, *insulsus*, *ovatus*,—possess, during the breeding season, a corneous sheath upon the tuberiferous metacarpus of the inner anterior digit, as occurs in *Discoglossus* and *Scaphiopus*. Specimens of males in which the generative organs are not enlarged, are destitute of this pellicle; it is, however, readily lost after saturation in fluid. Its object here, as elsewhere, is to assist the powers of prehension of the male.

The following table contrasts the peculiarities of the West Indian species :

- A. Posterior margin of area of cephalic dermoössification continuous with the skin of the nape;
 - a. Without distinct cordiform outline.
 - β. Its length from end of muzzle equal to breadth of jaws opposite middle of orbits.
- Muzzle acuminate; tongue entire; fingers scarcely webbed *insulsus*.
- Muzzle rounded; tongue cordate; fingers well webbed..... *ovatus*.
- ββ. Length of casque from end of muzzle less than breadth of jaws opposite middle of orbits.
- Skin tuberculous; heel scarcely reaching muzzle; casque concave in posterior outline..... *marmoratus*.
- Skin nearly smooth; heel reaching beyond muzzle; casque straight in posterior outline..... *wrightii*.
- αα. Casque with posterior cordate outline complete from orbits;
- Canthus rostralis nearly straight..... *scutigerus*.
- AA. Posterior margin of casque elevated, crest-like.
- Length from muzzle to border of casque much less than breadth of jaws at middle of orbit..... *lichenatus*.
- Length from muzzle to border of casque equal or greater than breadth of jaws at middle of orbit..... *anochlorus*.

T. insulsus Cope, sp. nov.

Head elongate, outlines converging toward end of muzzle. Length from that point to posterior border of casque equal to distance across mouth at orbits. Top of cranium plano-concave, end of muzzle prominent, rounded in profile. Posterior outline of casque straight or slightly emarginate, extending nearly to tympanum. Canthus rostralis strongly marked, with a slight point or ridge one-third distant from orbit. Loreal region concave. Eyes very prominent, twice extent of tympanum. Vomerine teeth in transverse series. Internal nares equal ostia pharyngea. Tongue not emarginate. Skin of upper surfaces

1863.]

sparsely tuberculous. Three external digits one-fourth webbed. Heel reaching a little beyond orbit. When the markings of the upper surfaces are not obsolete, there is a brown band converging from the supercilium towards one upon the other side, then diverging, and becoming broken up on the iliac region. Lateral and posterior femoral regions marbled; extremities banded.

Length from muzzle to posterior margin of casque 16'';* least breadth between orbits 8'''. From casque to vent 4'' 5'''; anterior extremity 3'' 5'''; posterior extremity 8'' 8'''.

Habitat.—Cuba. From Prof. Poey. Mus. Smithsonian, Nos. 6265-6. Academy Natural Sciences.

T. o v a t u s Cope, sp. nov.

Length from extremity of muzzle to posterior border of casque equal to breadth from one os maxillare to the other at orbits. Head depressed, especially anteriorly; maxillary outlines much rounded, not acuminate. Muzzle rounded in profile. Canthus rostralis strong, but little concave, far within maxillary border; loreal region grooved. Posterior border of casque extending nearly from tympanum to tympanum, slightly doubly-convex. Eyes very prominent, more than twice the extent of the tympanum. Internal nares larger than ostia pharyngea. Tongue emarginate. Vomerine teeth between nares, in two postero-externally divergent series. Digits of anterior extremity nearly half-webbed. Heel reaching nearly to end of muzzle. Skin of upper surfaces nearly smooth.

Length from end of muzzle to posterior border of casque 1'' 7'''. Least width between orbits 7'''. Length from casque to vent 4'' 5'''; of anterior extremities 3'' 6'''; of posterior extremities 8'' 5'''.

Above deep brown, beneath immaculate; upper faces of extremities indistinctly barred; lateral and posterior femoral regions spotted, and marbled with brown.

Habitat.—Hayti, near Jeremie. Dr. Weinland's Collection in Mus. Comparative Zoology, Cambridge.

Perhaps this is the *T. dominicensis* Gthr., which does not appear to be the species so named by Duméril and Bibron.

T. m a r m o r a t u s Dum., Bibr.

Head short; maxillary outline broadly oval. Length from end of muzzle to posterior border of casque less than from one alveolar margin to the other at orbit. Frontal region concave, especially in old individuals. End of muzzle nearly vertical in profile. Casque extending from tympanum to tympanum in fully developed individuals; the posterior outline openly emarginate or concave. Canthus rostralis convergent, concave, but little elevated, with a more or less obsolete furcation or process, one-third of its length anterior to the orbit. Loreal region very oblique, concave. Orbits twice the extent of tympanum. Series of vomerine teeth either transverse, arcuate or oblique converging anteriorly. Posterior nares moderate. Tongue not or scarcely emarginate. Skin of upper surfaces coarsely, usually closely, tuberculous. Two external digits of anterior extremity very slightly palmate. Heel of extended extremity reaching from anterior to the orbit to near end of muzzle.

Length from end of muzzle to middle of posterior margin of casque (in ♀ from New Providence) 22'''. Breadth between orbits 12'''; length from casque to vent 5'' 6'''; of posterior extremity 11'' 5'''. Length of head and body in ♂ (from New Providence) 4'' 6'''.

Specimens of this species in alcohol are either rufous brown, varied with dark brown, blackish brown, ashy, with confluent brown spots, or olivaceous, with close brown or black reticulations.

Habitat.—Cuba, De La Sagra, Poey. New Providence, Wood, Bryant. Hayti, Weinland, Cuming, ?Ricord. Jamaica, Gosse, Adams. Mus. Academy Nat.

* The centimetre and millimetre are used in this paper.

Sciences, Philada.; Boston Nat. Hist. Soc.; Compar. Zoology, Cambridge; Smithsonian, Washington.

The palmation of the fingers in this species varies between bare existence and an extent equal to one-fourth the length of the digits. The series of vomerine teeth are either arched or straight. As the peculiarities of the *Hypsiboas dominicensis* of Tschudi, as defined by Duméril and Bibron, are exhibited within this range, I am induced to believe that it is but a nominal species. The *dominicensis* of Günther, possessing a more extensive palmation of the anterior digits, is so far similar to the *ovatus* from the same island. I agree with that author in assigning the same name to the Jamaican animal, which is, according to him, the frog called *Hyla brunnea* by Mr. Gosse. The specimens labelled erroneously in Mus. Paris as having been brought from Cape North, in Norway, under the name *Hyla septentrionalis*, belong to the present species according to the "Erpétologie Générale." It is the oldest name, but, being but a museum label, must be passed over.

Specimens from New Providence are of large size and with golden and olivaceous shades.

T. wrightii Cope, sp. nov.

Head short, broadly rounded; length from end of muzzle to posterior border of casque less than breadth of mouth opposite middle of orbits. This posterior border extends from tympanum to tympanum, and is not emarginate. Frontal region very broad, concave; muzzle oblique in profile. Canthus rostralis much within maxillary border, well marked, slightly concave, angle of convergence nearly right, with a weak descending ridge nearer orbit than nares. Eyes not very prominent, twice extent of tympanum, which equals discs of anterior digits. Loreal region concave. Vomerine series not short, transverse; inner nares not much larger than ostia pharyngea. Tongue very broad, slightly emarginate. Anterior digits scarcely palmate. Heel reaching beyond end of muzzle; tibia measures a little more than twice from nostril to posterior border of casque. Skin of upper surfaces very sparsely tuberculous.

Length in a ♀, from end of muzzle to posterior border of casque, 2'' 5'''. Least breadth of frontal region 1'' 2'''. Length from posterior border of casque to vent 5'' 7'''; of anterior extremity 5'' 5'''; of posterior extremity 13'' 2'''.

Above purplish brown, beneath yellowish; gular region brown-shaded; sides and interior faces of femur and tibia marbled, and external faces of limbs banded with brown.

Habitat.—District of Guantanamo, Southeastern Cuba. Discovered by Chas. Wright, to whom it is dedicated. Mus. Smithsonian, (No. 5174.)

T. scutigera Cope, sp. nov.

Head more elongate; maxillary outline regularly rounded or slightly truncate. Length from end of muzzle to posterior border of casque less than distance across the mouth opposite middle of orbits. Profile from occiput to muzzle gently arched, the latter not depressed, vertical (truncate) in profile. Canthus rostralis elevated, straight or convex just interior to orbit, converging at an acute angle, without branch-ridge. Loreal region nearly vertical, with a delicate groove between two patches of ossification. Cephalic dermo-ossification with a distinctly-defined cordate outline posteriorly; separable more or less distinctly into two parietals, a pentagonal frontal and two elongate convergent nasal plates; where the latter are in contact with the parietals (on the superciliary margin) there is often an emargination. Eyes not prominent vertically, twice the extent of tympanum. Internal nares very large. Vomerine teeth in two short, widely-separated, straight or slightly curved series, which converge anteriorly between the posterior margin of nares. Tongue scarcely emarginate. Anterior digits one-fourth to one-third webbed. Heel scarcely reaching beyond orbit. Skin very sparsely tuberculous or smooth.

1863.]

Dimensions of a female.—From end of muzzle to posterior border of casque 2" 4"; least width of frontal region 1" 5"; greatest width of casque posteriorly 2"; from casque to vent 5" 8"; anterior extremity 4" 6"; posterior extremity 10" 8". Length of head and body of a ♂ 5" 6".

In spirits, brown; a blackish band or spot behind tympanum, one across casque behind interorbital space, one on anterior dorsal, and some transverse blackish lines on scapular region. Extremital bands with pale borders; sides brown-spotted; a large brown, pale-bordered anal spot.

Habitat.—Jamaica, Prof. C. B. Adams. Mus. Smithsonian, (6268.) Academy Nat. Sciences.

T. lichenatus Gosse.

Head short, broadly rounded in outline; length from end of muzzle to most distant point of posterior margin of casque much less than breadth of mouth at middle of orbits; about equal to distance from one supratympanic ridge to the other. Frontal region very concave; profile of muzzle nearly vertical. Canthus rostralis short, very concave, forming a sharp elevated ridge posteriorly, with a short descending branch nearer the orbit; almost obsolete near the external nares; shorter than interorbital breadth. Casque with an elevated, crenulate, doubly-convex posterior margin; rugose, especially upon the superciliary region. Eyes very large and prominent, three times the extent of the tympanum; the latter is obliquely elliptic, contracted antero-superiorly, and bounded above by a crenulate arched ridge. Tongue broad, not emarginate. Vomerine teeth in two short, curved, well-separated series, between the posterior parts of the very large internal nares. Ostia pharyngea relatively small. Exterior anterior digits one-third palmate; palattes as large as tympanum. Heel reaching anterior border of orbit. Skin of upper surfaces roughly, medially sparsely, tuberculous; some prominent elevations near vent, two on the heel, and several on the tarsus and antebrachium.

Dimensions of ♂.—Length from end of muzzle to posterior border of casque 3"; from latter point to vent 7" 4"; breadth of interorbital space 1" 7"; length of anterior extremity 6" 2"; of posterior, 14" 4".

Color in spirits yellowish brown, with deep brown variations, most distinctly on the occipital, interscapular and the superior lateral regions; sides and gular region coarsely brown-spotted. Extremities, including tarsus and foot, cross-banded. Under surfaces yellowish.

Habitat.—Jamaica, Gosse, Adams. Mus. Smithsonian; Amherst, Mass.

Mr. Gosse has given an interesting account of this very singular tree-frog in his "Naturalist's Sojourn in Jamaica,"—a work which is ever recurred to with pleasure. He has also described the colors as they appear during life, which are brilliant: they scarcely assist the student in separating the species when rendered unnatural by preservation in alcohol.

T. anochlorus Gosse.

Head elongate, maxillary outlines more acuminate than in the preceding species. Length from end of muzzle to most distant point of posterior margin of casque equal to or greater than distance from alveolar ridge to ridge at middle of orbits, greater than distance from one supratympanic ridge to the other. Frontal region very concave; profile of muzzle vertical. Canthus rostralis as long as interorbital breadth; it forms an acute elevated ridge, which has its median portion nearly transverse, and making nearly right angles with the anterior and posterior portions. Posterior outline of casque much elevated, cordiform, with radiating ridges. A supratympanic serrate ridge. Eyes less prominent, twice the extent of the oval tympanum. Internal nares very large; vomerine teeth in short convex series between them. Tongue a little broader than long, entire. External anterior digits nearly half-webbed. Heel extending to anterior margin of orbit. Skin of upper surfaces sparsely tuberculous, promi-

[Mar.

ment tubercles on antebrachium, heel and tarsus. Abdominal areolations rigid, prominent.

Dimensions of a ♂.—From end of muzzle to convexity of posterior border of casque 2'' 9'''. Breadth of frontal region 1'' 4'''. Length from casque to vent 6'' 5'''; of anterior extremity 5''; of posterior do. 12'' 7'''.
Color in spirits, above uniform olivaceous; lateral and internal femoral regions marbled; extremities above banded with brown; mandibular region delicately brown-marbled. A dark anal spot.

Habitat.—Jamaica. Drs. Gosse, Betton, Adams. Mus. Academy Natural Sciences; Amherst College, Mass.

It is altogether probable that this is the species described by Mr. Gosse, in his work previously mentioned, under the name adopted. His description, relating principally to coloration, is not conclusive towards any identification.

Its affinities are altogether with the *lichenatus*, both being peculiar in the elevation of the posterior margin of the casque into a transverse crest. It differs in the greater elevation of this crest, the more elongate proportions of the cranium, the angulation of the canthus rostralis and less prominence of eyes, besides minor points.

HYLA LAUR.

Hyla miotypanum Cope, sp. nov.

Skin of superior surfaces smooth; gular region areolate; a gular and antepectoral fold, also one across the axilla; another running from inferior anterior face of thigh obliquely upwards to the iliac region. A fold across extremity of forearm, above carpus. Outer fingers one-fourth, toes extensively, webbed; palettes larger than tympanum; posterior extremities slender; the heel reaches the end of the muzzle. Muzzle broadly rounded; canthus rostralis short, loreal region oblique. Nostils vertical. Eyes very prominent, six times the extent of the small tympanum. Tongue slightly emarginate. Vomerine teeth in two elongate fasciculi between internal nares, presenting an obtuse angle posteriorly.

Length from muzzle to upper border of tympanum 1''; breadth of jaws opposite middle of orbit 1''. Length from tympanum to vent 2'' 3'''; of anterior extremity 1'' 9'''; of posterior extremity 5'' 1'''.
In spirits, above purplish ash, (probably green in life,) with or without a few lighter specks, and indistinct darker reticulations. Extremities paler, not barred; a light border from heel to digits, another bounding superiorly a subanal spot. Under surfaces yellowish; superior labial border and lateral stripe bright yellow, the latter sometimes not well separated from the abdominal shade.

Habitat.—Near Jalapa, Mexico. Obtained by Sr. R. Montes de Oca. Mus. Smithsonian, (No. 6311,) Mirador, Dr. Sartorius.

A species to be compared with *rhodopepla Gthr.*, *rubicundula R.* and *L.*, *luteola Burm.*, *molitor Schm.*, but differing from all in the minuteness of its tympanum. In *viridis* the tympanum is larger, the head is more elongate and the hands less palmate, besides the presence of a yellow band on the tibia.

Hyla palliata Cope, sp. nov.

All the digits of posterior extremity palmate to penultimate phalanx; of the anterior the three external are one-third webbed. Metacarpus of inner digit with a large tubercle. Tympanic disc one-sixth the size of the eye. Vomerine teeth in a short uninterrupted series behind posterior margin of internal nares. Tongue oval, nicked. Muzzle prominent, truncate; loreal region not concave. From nostril to orbit equal diameter of orbit, and is less than the width of the interorbital space. One vocal sac. Skin smooth above, not granulated on the gular region. The end of the tibia reaches middle of orbit when the limb is extended.

1863.]

Length of head and body 19''; of anterior extremities 10''; of posterior 25''.
Extremities, lower surfaces, loreal and labial regions grayish-brown; upper surface of head and body pale ochreous, abruptly separated from the other color all round.

Habitat.—Paraguay. From Capt. Page's Expedition. Mus. Smithsonian, (No. 6225;) Academy Natural Sciences.

Hyla baudinii Dum. *Bibr.*, Erp. Gén., viii. 564, 1841.

The names *Hyla vanolioti*, published in these "Proceedings" for 1854, p. 61, and *H. muricolor*, 1862, 359, apply to forms of this species. It is found in Texas, Eastern Mexico and Honduras. Mus. Academy, Phila.; Smithsonian.

Hyla (*Hypsiboas*) *oxyrhina* *Rhd.* et *Lütke.*, Videnskab. Meddelelser, etc. Kjøbenhavn, 1862, p. 189.

This species is identical with that described in these "Proceedings," 1862, p. 353, as *Hypsiboas raniceps*. The name of the distinguished Danish zoologist must be retained, as the memoir in which it appeared was issued some months prior to our own. The former has just come into our hands.

HYLODES Fitz.

Hylodes planirostris *Cope*, Pr. A. N. S. Philada., 1862, p. 153.

This species, hitherto known as a native of the Bahama Islands, has been sent to the Mus. Smithsonian (No. 6310) from Southern Florida by Dr. Cooper. It is the only species of the genus found in the United States, though Holbrook and Agassiz have described frogs under this name from our country. These belong to the genera *Acris*, *Hyla* and *Pseudacris*. Other reptiles common to the Bahamas and Florida are *Anolis principalis* and *Sphærodactylus notatus*.

The following species of *Hylodes* form a little group which I have called *Craugastor*,—Proc. A. N. S., 1862, p. 153. They can be distinguished as follows:

H. pulchrigulus, l. c., 1862, 357.

Tympanum one-fourth extent of orbit; the latter equal distance from its anterior border to end of muzzle. Carpus reaching anterior border of orbit. Muzzle truncate. Tongue emarginate. Loreal region concave. End of tibia reaching the end of the muzzle.

H. griseus.

Hyla grisea, Hallow., Pr. A. N. S. Phila., 1860, p. 485.

Tympanum obliquely elliptic, one-third the extent of the orbit; diameter of the latter less than the length of the rather elongate and rounded muzzle. Carpus and end of tibia reaching the end of the muzzle. Loreal region concave; canthus rostralis strong. Tongue emarginate; external metatarsal tubercle not developed.

H. hallowelli *Cope*, l. c., 1862, 153.

Tympanum horizontally elliptic, equal one-third extent of orbit; latter equal in diameter to length of muzzle, which is much rounded; loreal region nearly plane; canthus rostralis weak. Carpus reaches end of muzzle, the tarsus only the orbit. Two well developed metatarsal tubercles. Tongue entire; mandibulum rounded.

Herr Schmidt has not given the minuter peculiarities of his *H. (Craug.) fitzingerii* so as to enable us to distinguish it from the above. It is most like the *pulchrigulus*.

PHYLLOBATES Bibr.

Phyllobates latinasus *Cope*, sp. nov.

Head elongate; front plane transversely, gently arched longitudinally, a little wider than from orbit to end of muzzle. The latter is prominent, broad and concavely truncate; external nares lateral. Loreal regions plane. Internal

[Mar.

nares widely separated. Tympanum round, equal one-fourth extent of orbit, whose diameter equals length of muzzle from orbit. A slight web between outer fingers, of which the second is shorter than the inner or first; one large carpal tubercle, one on metacarpus of thumb. A dermal fold on the tarsus. Two metatarsal tubercles. The carpus reaches the end of the muzzle, and the heel the anterior border of the orbit. Length of head and body 3".

Above brown; a black band across end of muzzle and loreal region, through eye to groin; pale-bordered above on the muzzle, and interrupted by an oblique white line from the femur. Femur dark posteriorly, tibia cross-banded; (color of limbs not well preserved.) Beneath pale, immaculate.

Habitat.—Truando region, New Granada. Obtained by Arthur Schott, Esq., of the U. S. Expedition under Lieut. Michler.

HYLAPLESIA Boie.

Hylaplesia truncata.

Phyllobates truncatus Cope, Pr. A. N. S. Philada., 1860, p. 372.

A certain serrulation of the alveolar ridge of the maxillary bone, in this and the following species, greatly resembles dentition, and has caused their erroneous reference to *Phyllobates*, instead of *Hylaplesia*.

This animal is most like the *H. obscurus e Dum.*, *Bibr.*, but has much shorter posterior extremities. In both the anterior extremities equal the head and body; in the former they are more than half the length of the posterior, in the latter, considerably less than half. In the *truncatus* the first and second fingers are equal; their expansions are one-fourth the size of the tympanum. The neural spines are very much dilated and thickened, especially that of the axis. There is a transverse bony ridge on the occiput.

Hylaplesia aurata.

Phyllobates auratus Girard, U. S. Astronomical Expedition, ii. p. 209.

In this species the muzzle is rounded, and the first finger shorter than the second, as in the *H. tinctoria*. It has no occipital ridge, and the neural spines are only slightly thickened. Dilatations of posterior extremities one-fourth extent of tympanum; of anterior, one-half the same. The ground color is black or brown. Crown and muzzle surrounded by a golden band; two postscapular transverse annuli on each side, in contact on the median line; a yellow annulus on each inguinal region; smaller rings on humerus and tibia. On pale specimens these markings are represented by refulgent bands which are readily destroyed or passed over; hence the imperfections of Girard's description.

BUFONIDÆ.

Rhæbo hæmatiticus Cope, Pr. A. N. S., 1862, p. 357.

The genus *Rhæbo* is to be distinguished from *Bufo* by the presence of the manubrium sterni, in addition to the characters given, l. c., p. 358. I have had opportunity of observing it in the present species and the *R. leschenaultii*. This character has been denied to all *Bufones* in Stannius' "Handbuch der Zootomie." I find it also in "*Bufo similis Schm.*," l. c., p. 357, which can hardly be placed in *Rhæbo*. I cannot assign it to a new genus until the value of its peculiarities is better known.

The genus of *Bufonidæ* for which I have adopted, in the above quoted article, Fitzinger's name *Chilophryne*, is not alone characterized by the presence of a parietal branch or continuation of the supraorbital ridge, as there indicated; but rather by the straightness of the latter, its not describing the usual arc of the orbit, and its angle with the postorbital ridge, when the latter is present. The parietal ridge sometimes exists in a rudimentary or fully developed condition in *Phrynoidis*. *P. sternosignatus e Gthr.*, illustrates the first case, and *P. d'orbigny* the last. As the latter species is the type of *Chilophryne* 1863.]

Fitz., this name must become a synonyme of Phrynoïdis, and the genus to which I first applied it he called Incilius. The species which truly belong to it are *I. lentiginosus*, *cognatus*, *woodhousei*, *americanus*, *nebulifer*, *veraguensis*, *coniferus*, *dialophus*, and probably *biporcatus*. The species *d'orhignyi*, *celebensis* and *occellata* formerly referred to it, must be placed in Phrynoïdis Fitz.

Bufo diptychus Cope, l. c., 353, is the species described by Dr. Girard, as *B. poeppigii* Tsch., in Herpetology of U. S. Exploring Expedition. It is distinct from Tschudi's toad.

CERATOPHRYDIDÆ.

This family has been recognised in an indefinite way by Dr. Tschudi,* who gives as its distinguishing features "kopf sehr gross, eckig, schief nach vorn verlängert; Hautverlängerungen am obern Augenhiede." He includes in it the genera *Ceratophrys*, *Phrynocerus*, *Megalophrys* and *Asterophrys*. The unnatural nature of this union has been demonstrated by Dr. Günther, who places *Asterophrys* and *Megalophrys* in separate families, and assigns *Ceratophrys* with *Phrynocerus* to the *Ranidæ*. The *Ranidæ* of Günther is, however, a heterogeneous group; and I would separate under Tschudi's name those genera of toad-like animals in which the *manubrium sterni* is wanting. These are *Ceratophrys*, *Phrynocerus* and *Pyxicephalus*; † probably *Calyptocephalus* will enter the same series; but these I have not seen. Tschudi's inapplicable characters may be replaced by the following. *Form stout, bufonine; head broad, elevated. Os maxillare toothed. Extremities short; digits without terminal discs; the posterior more or less webbed. Ear perfectly developed. Diapophysis of sacral vertebra cylindrical. Manubrium sterni wanting. Paratoids present or absent.* I am not now acquainted with other peculiarities, though they doubtless exist.

The System of *Opisthogloss Anura* proposed by Günther, like the system of *Ophidia* of the *Erpétologie Générale*, is a valuable index of the subject, but not an exposition of the scheme of nature. I have already ‡ ventured the opinion that a primary division into forms with, and forms without dilatations upon the extremities of the digits cannot be maintained: this character must be subordinated, as that of the presence or absence of teeth on the maxillary bones as employed by Duméril and Bibron, has been by Günther himself. He attaches greater value to the former because it "is connected with a strongly-marked distinction in the mode of life." This appeal to adaptations is not uncommon; but we now know enough of the system, to believe that the relations of its parts are to be determined by homological and embryological considerations combined, which coincide also with chronological and geographical. Have we not creatures of similar habits and adaptations in the most diverse groups? It is enough to mention to a herpetologist the arhoreal *Viperidæ* and *Crotalidæ*; the corresponding types of *Pleodonta* and *Cœlodonta*, of *Acrodonta* and *Pleurodonta*; the gill-hearing *Siredon* and *Siren*, and a host of other such; the parallelisms of the *Implacental* and *Placental Mammalia*, etc. Also the supposed *Neotropical Shrikes* and *Certhiidæ* are *Clamatores*, and the supposed *Salmonidæ* are *Characins*. In comparing many of these cases, we observe, too, how by approximation in time, analogy becomes affinity.

In pursuance of this view, the probability of a distinction between the *Hylodidæ* and *Cystignathidæ* of Günther has appeared to the author to vanish in great measure. The discovery of the genus *Tarsopterus* of Reinhardt and Lütken, in connection with that of *Plectromantis*, by Wagner, has confirmed this opinion. The two genera are incontestably nearly allied, as urged by Reinhardt,|| though the

* *Classif. der Batrachier*, 26.

† Stannius' statement, "Zootomie der Amphibien," p. 17, that *Pyxicephalus* possesses the *manubrium*, relates properly to the species now called *Tomopterna*, which were formerly included under that genus.

‡ *Proc. Acad. Philadæ.*, 1862, p. 351.

|| *Videnskab. Meddelelser Kjøbenhavn*, 1862, p. 240.

latter only has paratoid glands. Their margincd toes are but a step beyond those of certain Cystignathi; their digital dilatations are as distinct as those of many Hylodidæ. The family of Cystignathidæ, thus composed, would contain the types *Platyplectrum Gthr.*, *Limnodynastes Fitz.*, *Cystignathus Wagl.*, *Pleurodema Tsch.*, ?*Gomphobates R.* and *L.*, *Ischnocnema R.* and *L.*, *Liuperus D.* and *B.*, *Tarsopterus R. & L.*, *Plectromantis Peters*, *Crossodactylus Dum.*, *Bibr.*, *Phyllobates Bibron*, *Hylodes Fitz.*, (or the genera into which the last may be divided.) In this association the paratoids of *Plectromantis* have but little weight, as in *Pyxicephalus* in our *Ceratophrydidae*; and it is probable that it will again be found that their presence or absence is immaterial in the definition of certain families in the Anura, although others may be well characterized by them, as in Günther's method. The genera *Pelodryas Gthr.*, and *Scytotis Cope*, with large paratoids will probably be referred to the *Hylidæ*, which has been defined as destitute of them.

Pyxicephalus cultripes.

Odontophrynus cultripes Rhdt. and Lütke., Videnskab. Meddelelser, etc., Kjobenhavn, 1862, p. 159.

If we introduce the presumed genus *Odontophrynus* into Duméril and Bibron's table of genera of Raniformia, the only character which seems to separate it from *Pyxicephalus* is the concealed tympanum of the former, as distinguished from its visibility in the latter. This character is sometimes of very little value, the tympanic disc being more or less distinct in different individuals of the same species of many Anura, in proportion to the tenuity of the epidermis. This is especially seen in species of *Bufo*. The text relating to *Pyxicephalus americanus*, however, settles all doubts, as it says, "Tympan imperceptible au travers de la peau." In their Latin diagnosis, Reinhardt and Lütken say "dentes** non in palato;" but in the text, "To langagtige i midten ikke sammenstødende Tandgrupper ere stillede paa Ganen mellem de indre Næsebor," etc. As the figure represents palatine teeth, they are doubtless present. The species cannot, therefore, be separated from *Pyxicephalus*. It is very nearly allied to, if not identical with, the frog called *Pyxicephalus? n. sp.*, in the recently-published Catalogue of the collection brought home by the United States Paraguay Expedition.*

ALYTIDÆ.

SCAPHIOPTUS.

The species of this genus are seven in number; they are found throughout the temperate regions of North America, and as far southward as the City of Mexico. They represent the single *Alytes obstetricans* of Europe, which differs in its want of manubrium sterni, its slightly-webbed toes, and its cuneiform bone forming but a tubercle; and the *Helioporus albipunctatus* of Australia, where there is a spur upon the thumb, and trihedral diapophysis of sacral vertebra. They may be at once separated by means of the following synopsis:

- I. A gland in the upper integument of tibia.
 Head short; tympanum concealed..... *multiplicatus*.
 II. No gland in upper integument of tibia.
 a. No pectoral glands.
 β. Length of tibia three times frontal breadth.
 Muzzle depressed, prominent.
 Tympanum concealed..... *couchii*.
 Muzzle elevated, truncate in profile.
 Front plane;
 Loreal region convex, oblique..... *varius*.

* Proc. A. N. S., Phil., 1862, 352.

Loreal region straight, nearly vertical..... *rectifrenis*.
 Front swollen..... *bombifrons*.
 $\beta\beta$. Length of tibia four times frontal breadth.
 Muzzle truncate in profile..... *hammondii*.
 $\alpha\alpha$. A gland on each side of thorax, near axilla.
 Tympanum one-half the extent of the eye..... *holbrookii*.

S. multiplicatus Cope, sp. nov.

Form broad, squat. Head very short; profile rapidly descending; maxillary outlines acuminate, oval; muzzle thick, rounded. Eyes very prominent. From these a strong fold passes posterior to the angle of the mouth and across the gular region; tympanum covered by a portion of the paratoid gland anterior to this. Paratoid proper very large, extending beyond scapula, bent upon the side; bounded inferiorly by a strong fold, which extends from the one above mentioned to the groin. Below this, on the sides, are two or more others. Skin of upper surfaces coarsely tuberculous, that of the crown thick, of the extremities nearly smooth. A large gland occupies most of length of tibia. Abdomen minutely, pubic region coarsely, rugose. Cuneiform process rather short, very prominent. Vomerine teeth in fasciculi opposite posterior margins of choanæ; the latter smaller than ostia pharyngea. Tongue entire, with a narrow, free anterior border; on third free posteriorly.

Dimensions of a ♀.—From end of muzzle to vent 5" 1"; muzzle to behind tympanum 16"; length of anterior extremity 2" 6"; of posterior extremity 5" 4".

Color in spirits: above ashy-brown, below yellowish-ash.

Habitat.—Valley of Mexico. Sent by Mr. Jno. Potts to the Mus. Smithsonian, (No. 3694.)

This species is very bufonine in aspect, and might be regarded as representing a different genus from the type of *holbrookii* were it not for the existence of *couchii* and *bombifrons*.

S. couchii Baird, Proc. A. N. S., Phila., 1854, p. 62. Rept. U. S. and Mex. Bound. Surv., Reptiles, p. 28, pl. XXXV. figs. 1-6.

Form stout; head more elongate, acuminate oval; width of frontal region greater than from lip to nares, one-third the length of the tibia. Profile gradually descending; front plane, muzzle projecting, rounded. Anterior border of tympanum scarcely distinguishable. Eyes very prominent. Vomerine teeth opposite middle of choanæ, which equal ostia pharyngea. Tongue slightly emarginate. Paratoid gland flat, descending on the side. Skin tuberculous, especially on the sides; sometimes a slight cryptiferous thickening of integument of tibia; none on the sides of the pectoral region. A posttympanic and an antepectoral fold. Abdomen slightly rugose; gular region smooth. Cuneiform process elongate. Toes fully palmate.

Dimensions of a ♂.—From end of muzzle to vent 5" 5"; from same to behind tympanum 2". Anterior extremity 3" 5"; posterior extremity 5" 6".

Color above yellowish, with irregular brown bands, which converge between and behind the orbits; others diverge on the flanks, beginning at the orbits; one from same point to lip, and one on canthus rostralis. There is a confluence of dorsal bands near the sacrum. A light band on outer face of tarsus and toe; hand yellowish.

Habitat.—Tamaulipas. Mus. Smithsonian, (3713.) Lieut. Couch.

S. varinus Cope, sp. nov.

Outline of muzzle acuminate-oval; the end little depressed, nearly vertical in profile, distance from lip to nostril less than frontal breadth; the latter one-third tibia. Canthus rostralis obsolete, approximate; loreal region convex, very oblique in transverse section. Eyes prominent. Tympanum concealed or distinct, one-third extent of eye. Vomerine teeth opposite posterior border

[Mar.

of choanæ. Skin rather smooth, especially on the head. No posttympanic or antepectoral fold. No thoracic aggregation of cryptæ; paratoids flat, small. Palmation of posterior digits extensive; cuneiform process prolonged longitudinally.

Dimensions.—Total length 5'' 3''; from end of muzzle to behind tympanum 19''; of anterior extremity 3''; of posterior 5'' 9''.

Above yellowish olive, with numerous defined brown bands and spots, which have a general longitudinal direction, and cover more surface than the ground color. A spot across each eyelid, one beneath the eye, one on the end of the muzzle. Extremities marbled; beneath olivaceous yellow.

Habitat.—Cape St. Lucas, Lower California. Mus. Smithsonian, (No. 5893;) Philada. Academy. From John Xantus, Esq.

S. rectifrenis Cope, sp. nov.

Outline of maxillæ acuminate-oval; muzzle prominent, truncate in profile, superior face decurved. Canthus rostralis strong; loreal region plane, nearly vertical. Frontal region plane, its width one-third the length of the tibia. Tympanum concealed. Vomerine fasciculi closely approximate, posterior to hinder margin of choanæ. Skin of head and body sparsely tuberculous. A weak antepectoral fold. Paratoids rather lateral; no thoracic cryptæ.

Dimensions.—From muzzle to vent 2'' 8''; from muzzle to brachium 14''; length of anterior extremity 15''; of posterior 3''.

Coloration.—Above brown, or brownish-gray, the tubercles tipped with brown. A brown line extends from each eye to sacrum, converging posteriorly. Sides brown marbled posteriorly; a short brown band from tympanum. Below light yellow or brownish.

Habitat.—Tamaulipas, (Smithsonian, No. 3715.) Coahuila, (3714.)

S. bombifrons Cope, sp. nov.

Outline of maxillæ acuminate-oval; muzzle truncate, elevated, thickened transversely; profile of vertex arched, of front concave; canthus rostralis replaced by a concavity. Tympanum concealed or scarcely visible; paratoid flat, small. No gland on tibia or pectus. Tongue entire. Vomerine teeth in oblique fasciculi or short series between choanæ; these equal ostia pharyngea. Skin nearly smooth, roughest on the sides. Cuneiform process produced. Palmation of toes deeply repand.

Dimensions of a ♂.—From end of muzzle to vent 4'' 2''; same to behind tympanum 1'' 5''; length of anterior extremity 19''; of posterior 4'' 6''.

Color in spirits: pale ashen or brown, with numerous plumbeous vermiculations, which are aggregated into a blotch on the scapular region, which has a pale space below it. Limbs vermiculated; outer border of tarsus and foot light. A dark spot on canthus rostralis.

Habitat.—Fort Union, on Missouri River, lat. 48° N., from Mr. E. J. Denis, (Smithsonian, No. 3704.) On Platte River, 200 miles west of Fort Kearney, from W. S. Wood, of Lieut. Bryan's Expedition, (Smithsonian, No. 3520.) Llano Estecado Texas, Capt. Pope's Exped. Coll., (Smithsonian, No. 3703.)

This species has the most northern range of those found west of the Mississippi.

S. hammondii Baird, Report Surv. for Pac. R. R., v. x. Lieut. Abbot's Rep., pt. iv., p. 12, pl. XXVIII. f. 2.

Maxillary outline acuminate-oval; muzzle somewhat truncate, perpendicular in profile. Region of canthus rostralis concave; front plane or a little concave, with a weak ridge on each side, which is most distinct posteriorly; the width one-fourth length of tibia, and less than from nostril to lip. Eyes prominent; tympanum distinct, one-fourth the extent of the former. A fold behind angle of mouth. Paratoids flat, small; no gland on tibia or pectus. Tongue very large, entire. Choanæ large; vomerine teeth in transverse series between them. Skin roughly tuberculous, especially on the sides; thick on the occiput; below nearly smooth. Cuneiform process produced.

Dimensions of ♂.—Length from end of muzzle to vent 4'' 9''; from muzzle to behind tympanum 1'' 8''; of anterior extremity 2'' 9''; of posterior 6'' 1''.

Color above stone brown in alcohol, with traces of two paler dorsal bands. Tubercles fulvous-tipped; extremities shaded with the same. Below whitish, immaculate.

Habitat.—California. Mus. Smithsonian, 3695. From Fort Reading, lat. 40° 20'.

S. holbrookii Baird, Rept. Surv. Pac. R. R., v. x. Lieut. Abbot's Rep., pt. iv., p. 12, pl. XXVIII. f. 1.

Rana holbrookii Harl., Med. and Phys. Res., 1835, p. 105.

Scaphiopus solitarius Holb., N. Am. Herp., 1836, vol. i., p. 85. pl. XII. Ibid (edit. alt.) 1842, iv. 109. pl. XXVII. Tschudi, Mém. Neuchatel, i., 1838, p. 83. Dum., Bibr., Érp. Gén., 1841, viii., 473. Le Conte, Pr. A. N. S. Phil., 1855, 429. Günth., Catal. Batr. Sal. Brit. Mus., 1858, p. 38.

Head large, maxillary outline rounded. Profile of front a rather steep descent from the swollen occiput, where the skin is thin, closely adherent and penetrated by osseous granules. Eyes prominent; tympanum distinct, half its extent vertically elliptic. Tongue large, elongate, emarginate. Choanæ equal or larger than ostia pharyngea; vomerine teeth in two fasciculi between and opposite their posterior borders. Paratoids small, rounded, prominent; no gland on the tibia; one on each side of the thorax near the axilla. Skin of back minutely tuberculous; of sides more coarsely; below nearly smooth. Cuneiform process longer than in any other species of the genus, but not more prominent.

Dimensions of ♂.—5'' 8'' from end of muzzle to vent; from same to posterior border of tympanum 2'' 2''; length of anterior extremity 3'' 3''; of posterior 12'' 5''.

Color above, in spirits, either earth-brown, fulvous-brown or ashy-brown, with a pale ashy band from each orbit; these converge on the interscapular region, then diverge, and converge again on the coccyx. These bands are rarely unbroken, and are sometimes exceedingly indistinct; they sometimes inclose a pale area. Sides sometimes marbled with pale ash, sometimes uniform. Sometimes a pale interorbital crossband, sometimes two longitudinal bands on muzzle. A vertical light line on end of muzzle.

Habitat.—From Massachusetts into Florida and Mississippi.

Specimens in Mus. Smithsonian from Cambridge, Mass., are nearly unicolor, while Floridan forms are lightest and most variegated; the head seems to be a little broader and more obtuse. These forms graduate into the intermediate and most common type.

AMBLYSTOMIDÆ.

Spelerpes chiropterus Cope, sp. nov.

Head elongate oval; muzzle prominent, truncate, as broad as length of antibrachium. Series of palatine teeth arched, commencing behind the choanæ. Anterior limb extended forward, reaches orbit. A prominent wing-like rudiment only of the inner digit on both pairs of extremities. Thirteen lateral folds between axilla and groin; the extended posterior limb reaches the sixth, counting from the groin. Soles broad, smooth. Tail cylindrical, rapidly tapering, one-fifth longer than head and body.

Length from muzzle to vent 3'' 1''; from muzzle to axilla 12''; length of tail 4''.

Color, brown above, paler medially; dirty white below.

Habitat.—Mirador, near Vera Cruz, Mexico. Sent by Dr. Sartorius to the Smithsonian Institution.

This is the third species of Salamander known to inhabit Mexico. In its characters it approaches the genus *Batrachoseps* Bonap. One of Dr. Sartorius' most interesting discoveries.

[Mar.